

NOAA NESDIS



Coral Reefs, the rainforests of the sea, thrive on a narrow temperature band across the Earth's tropical oceans.



NOAA NESDIS Coral Reef Watch

Over the past few years, anomalously warm Sea Surface Temperatures (SST) have led to an increased incidence of coral reef bleaching around the globe. Coral bleaching occurs as waters warm towards the coral's upper thermal range, corals expel their colorful symbiotic zooxanthellae leaving them devoid of any color and thus appearing to be bleached. Sustained bleaching over consecutive warm seasons increases the likelihood of corals not recovering from a bleaching event, and thus the potential permanent loss of the reef.

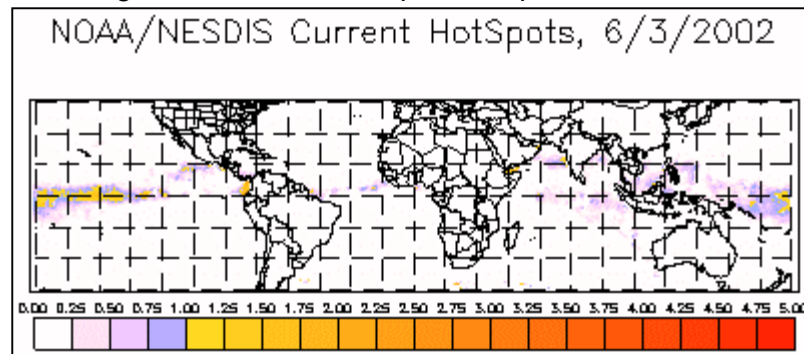


Figure 1.

*Web
accessible
Hot spot
maps*

Since 1995, the National Environment Satellite, Data and Information Service (NESDIS) has been producing Web-accessible, satellite-derived, sea surface temperature products to monitor for potential coral reef bleaching. Additionally, NESDIS has been providing technical support for coral reef mapping efforts, developing a robust and comprehensive international coral reef data management system, using paleo-climate records to describe coral reef environment in the distant past.

NOAA NESDIS received \$0.7 million for coral reef programs in FY-2002. They are part of a coordinated NOAA Coral Reef Conservation Program in partnership with NOAA's National Ocean Service (NOS), the Office of Atmospheric Research (OAR), as well as other NOAA Line Offices.

Why do we do it?

Coral reefs are one of the most diverse ecosystems in the world, supporting essential coastal fisheries, offering potential medicines, protecting coasts from erosion, and supporting coastal tourism industries.

Recent literature has shown that sustained water warming in excess of 1°C in conjunction with natural and human based stressors could



cause coral bleaching to become an annual event in most oceans, leading to severe effects worldwide, even allowing for some acclimation and genetic adaptation to occur. Passive, constant SST monitoring at global scales can provide researchers and stake holders with tools to understand and better manage the complex interactions leading to coral bleaching.

What do we do?

Scientists at NESDIS have developed experimental products using satellite SST imagery to monitor regions of concern. These products are designed to provide satellite information in a near-real time basis for rapid managerial assessment of areas of concern, as well as archived, very precise information to be used for scientific research.

Hot Spot and SST Anomalies Maps: Near real-time maps that depict twice-weekly areas of anomalously high (or low) SST. This information is critical to managers of reef areas as it provides a quick picture of the stress corals are withstanding resulting from warm waters

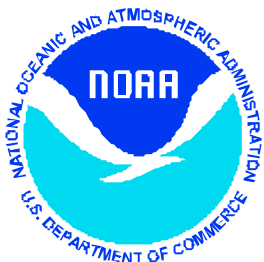
Degree Heating Weeks Maps: depicting the duration and strength of hotspots are now available for the southeast US-Caribbean-Central America region as well as the eastern and western hemisphere images

Bleaching Indices: This experimental product is designed to indicate the accumulated thermal stress that coral reefs experience. These experimental indices are based on the strength and duration of local HotSpots.

Pathfinder Data: We correct archived SST data for atmospheric anomalies using buoy water temperatures gathered from around the world. This results in the World's most accurate spatial data set of sea surface temperatures, which have proven to be a most valuable tool for research into the causes and effects of mass coral bleaching.

Coral Reef Information System: As part of the Coral Reef Strategy mandate, NESDIS is providing a wealth of satellite products in web-accessible formats through the Internet.

For more information regarding our products, visit our web site at http://orbit-net.nesdis.noaa.gov/orad/coral_bleaching_index.html
Our data and information holdings will also be available on-line through the Coral Reef Information System (CoRIS): <http://www.coris.noaa.gov/>



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